## REMARKS

Concurrently herewith, a Request for Continued Examination has been submitted. Accordingly, Applicants hereby request further examination of this application based on the amendments as set forth above.

Applicants acknowledge the indication of the allowability of the subject matter of Claims 2-10, as set forth in paragraph 4 of the Office Action. In particular, the latter claims would be allowable if rewritten in independent form. By the foregoing amendment, this has been done.

Claims 1 and 11 have been rejected under 35 U.S.C. §103(a) as unpatentable over Sonntag et al (U.S. Patent No. 5,780,981), while Claim 1 has been rejected as unpatentable over Adler et al (U.S. Patent No. 5,533,583). (Applicants note in this regard, that the first line of paragraph 3 of the Office Action refers to Sonntag et al, which appears to have been an oversight, since the rest of paragraph 3 refers to the Adler et al patent.) As discussed in greater detail hereinafter, however, Applicants respectfully submit that all claims of record herein distinguish over both Sonntag et al and Adler et al, whether considered separately or in combination.

The present invention is directed to a method for operating a load dependent power generating system which supplies electrical energy to an electric drive motor in a vehicle. In particular, the invention provides a method

for dynamically controlling the output power supplied by the power generating system in a manner which substantially eliminates or reduces any power deficit which might otherwise occur (in the absence of an accumulator) at the initial portion of any demanded acceleration of the vehicle. That is, in such systems, there is an inherent time delay between the input of a request for higher output from the electric drive motor, and the running up of the electric power generating system to a setpoint which provides power adequate to operate the motor as requested.

The present invention addresses and resolves this difficulty by providing to the power generating system a predictive performance setpoint value which anticipates the future power level which is to be demanded from the generating system. Such a predictive performance setpoint value is determined by taking into account the actuation speed of the accelerator pedal in order to forecast a predictive pedal position, as indicated, for example, at paragraph [0013] of the specification.

Since the performance setpoint value for the electric drive motor itself is determined based on the current actual accelerator pedal position, it is apparent that the performance setpoint value provided to the power generating system anticipates the future needs of the electric motor, such that sufficient power is available to accommodate the needs of the motor, without incurring a time delay

due to the otherwise necessary "running-up time" of the power generating system. That is, because the power output of the power generating system is based on a predictive setpoint value, while an output power command to the motor is based on a current setpoint value (based on accelerator pedal position), the system is able to respond in a more timely fashion.

The latter features of the invention are recited in Claim 1, which defines an operating method in which a power request is made to the power generating system based on a predictive performance setpoint value while the power request to the electric drive motor is based on the current performance setpoint value, with the predictive performance setpoint value of being determined on the basis of both accelerator pedal position and accelerator pedal movement. These features are neither taught nor suggested by the cited references.

The Sonntag et al reference, in particular, addresses the same problem as that which is solved by the present application, but does so in the opposite manner. In order to accommodate the inherent delay in the generation of increased power by the fuel cell 1, the system in Sonntag et al effectively delays the response of the electric motor by limiting the power demand which is input to it to a power value which is currently available from the fuel cell. Thus, the Sonntag et al system does not eliminate the inherent delay; rather, it simply limits the performance of the electric motor to accommodate the delay. Accordingly, the Sonntag et al reference does not teach or suggest the provision

of a predictive power setpoint value to the fuel cell, and does not therefore calculate any such predictive power setpoint value based on accelerator pedal movement.

As shown in Figure 2, the input accelerator demand FP is processed in blocks 21-30 to generate a desired compressor speed $n_{k\text{-}des}$ which is input to a compressor converter 11 for the purpose of controlling the air supplied to the fuel cell (and hence its power output) by the compressor 8. An air flow meter 7 measures the instantaneous actual value of the air flow (Column 2, lines 56-58), which is indicative of current power output by the fuel cell. The latter is processed in blocks 31-39 to generate a corrected accelerator pedal demand that is input, under certain operating conditions, to control the electric driving motor 19. The purpose and function of the corrected accelerator pedal demand $FP_{corr}$ is thus to prevent the driving unit 17 (Figure 1) from demanding more instantaneous current or power from the fuel cell 1 than the latter can supply. (See Column 4, lines 19-21, 33-35, and 56-60; Column 5, lines 2-4.) In this manner, the inherent time delay between the desired value indication (accelerator demand FP) and the actual air volume flow to the fuel cell (which determines fuel cell power output) is accommodated simply by limiting the power output to the motor, thereby delaying its response until sufficient power is available. The Sonntag et al patent therefore fails to teach or suggest a system in which the output of power demand of the electric motor is anticipated in the

form of a predictive performance setpoint value which is input to the fuel cell, thereby eliminating the delay.

The Adler et al reference, on the other hand, discloses a vehicle propulsion system in which electric drive motors 12 and 16 are driven by power provided by the combination of an internal combustion engine 4 and a generator 6. As with the present invention and with the apparatus in Sonntag et al, such a system must deal with the problem that a mismatch may exist in required motor power and instantaneously available generator output. In Adler et al, this problem is addressed by providing an electric accumulator (battery) that supplies power during a requested acceleration. (See, for example, Column 2, lines 54-56; Column 3, lines 6-9, 21-24; Column 7, lines 50-62; and Column 8, lines 20-26.)

It is noted that the accelerator pedal 27 in Adler et al includes a sensor arrangement 30 which sends signals to the control unit 20 including not only a position signal $\alpha$ representing the angular position of the accelerator pedal 27, but also a speed signal $\dot{\alpha}$ and an acceleration signal $\ddot{\alpha}$, as indicated in the specification at Column 7, lines 15-21. (In the text, the dots over the expressions $\dot{\alpha}$ and $\ddot{\alpha}$ appear to have been omitted.) It is important to note, however, that the system does not use either of the latter signals in order to generate a predictive performance setpoint value, as recited in Claim 1 of the present application. That is, when the driver depresses the accelerator pedal 27 from the first position into a second position at a predetermined speed $\dot{\alpha}$, the control unit 20

interprets the new accelerator pedal position as a request for a higher permanent output on the part of the ICE/generator 2. The inherent delay of the ICE/generator 2 in achieving a desired higher output is accommodated in Adler et al by providing electric power from the battery during such acceleration until the ICE/generator 2 can catch up to the electric power demand, as noted previously. (See Column 7, lines 53-56, 58-62; Column 8, lines 20-26.)

Accordingly, like Sonntag et al, Adler et al fails to teach or suggest a system in which a predictive performance setpoint value for the electric motor is input as a power request to the power generating system so that the power output of the power generating system anticipates the future needs of the electric drive motor. Accordingly, Claim 1 also distinguishes over Adler et al for this reason.

In light of the foregoing remarks, this application should be in condition for allowance, and early passage of this case to issue is respectfully requested. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and

please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #225/50968).

Respectfully submitted,

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